

SEQUENCE LISTING

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<120> Cyclic Depsipeptide Synthetase And Gene Thereof, And Mass Production System For Cyclic Depsipeptide

<130> 2002-0317A/LC/00144

<140> 10/070,387
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<213> Mycelia sterilia

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Asp Ala Pro Ala Thr Gly Ile Glu Val Lys Leu Lys Glu Leu Trp Phe			
1005	1010	1015	1020
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Phe Asp Leu Gly Gly Asn Ser Ile Ile Ala Ile Lys Met Val Asn Met			
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Pro Thr Leu Ala Gly Leu Val Asp Val Ile Gly Arg Asp Pro Ala Pro			
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Val His Ala Ser Pro Ile Ser Asp Leu Arg Ile Ile Asp Val Ser Gly			
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Gln	Leu	Asn	Gly	His	Arg	Glu	Arg	Asn	Asn	Tyr	Leu	Asp	Leu	Asn	Gly
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ctt	cta	aac	ggc	gga	acg	ctg	gtc	tgt	atc	gac	tat	atg	acc	acc	ctg
Leu	Leu	Asn	Gly	Gly	Thr	Leu	Val	Cys	Ile	Asp	Tyr	Met	Thr	Thr	Leu
							1825		1830				1835		5520
gac	agc	aaa	acg	ctc	gag	gcc	gcg	ttt	gca	cga	gaa	caa	atc	aac	gcc
Asp	Ser	Lys	Thr	Leu	Glu	Ala	Ala	Phe	Ala	Arg	Glu	Gln	Ile	Asn	Ala
							1840		1845				1850		5568
gcg	tta	ctc	acg	ccc	gct	ttg	ttg	aag	cag	tgc	cta	gcc	aac	att	ccc
Ala	Leu	Leu	Thr	Pro	Ala	Leu	Leu	Lys	Gln	Cys	Leu	Ala	Asn	Ile	Pro
							1855		1860				1865		5616
act	acc	cta	ggc	agg	ctg	agt	gca	ctc	gtt	att	gga	ggt	gat	agg	ctt
Thr	Thr	Leu	Gly	Arg	Leu	Ser	Ala	Leu	Val	Ile	Gly	Gly	Asp	Arg	Leu

1870	1875	1880	
gac ggc caa gac gcg atc gca gca cat gcg ctt gtc ggt gct ggc gtg Asp Gly Gln Asp Ala Ile Ala Ala His Ala Leu Val Gly Ala Gly Val 1885 1890 1895 1900			5712
tat aat gcg tat ggc ccg acc gaa aac gga gtg atc agt acg att tat Tyr Asn Ala Tyr Gly Pro Thr Glu Asn Gly Val Ile Ser Thr Ile Tyr 1905 1910 1915			5760
aat atc act aaa aac gac tcg ttc atc aac gga gtc ccc atc ggc tgt Asn Ile Thr Lys Asn Asp Ser Phe Ile Asn Gly Val Pro Ile Gly Cys 1920 1925 1930			5808
gca atc agc aat tcc ggc gcc tac atc aca gac cca gac cag cag ctc Ala Ile Ser Asn Ser Gly Ala Tyr Ile Thr Asp Pro Asp Gln Gln Leu 1935 1940 1945			5856
gta cct cct ggc gtc atg ggt gaa ctc gtc gtt acc ggt gac ggg ctc Val Pro Pro Gly Val Met Gly Glu Leu Val Val Thr Gly Asp Gly Leu 1950 1955 1960			5904
gcg cgg ggg tat aca gac cca gca cta gac gcg ggc cgc ttc gtc cag Ala Arg Gly Tyr Thr Asp Pro Ala Leu Asp Ala Gly Arg Phe Val Gln 1965 1970 1975 1980			5952
atc atg atc aat gac aag gcc gtg agg gcg tac cga acg ggt gac cgg Ile Met Ile Asn Asp Lys Ala Val Arg Ala Tyr Arg Thr Gly Asp Arg 1985 1990 1995			6000
gca cga tat cgc gta gga gac ggt cag atc gag ttc ttc gga cgc atg Ala Arg Tyr Arg Val Gly Asp Gly Gln Ile Glu Phe Phe Gly Arg Met 2000 2005 2010			6048
gat cag caa gtc aag atc cga ggt cac cgc att gaa cca gcc gaa gtg Asp Gln Gln Val Lys Ile Arg Gly His Arg Ile Glu Pro Ala Glu Val 2015 2020 2025			6096
gag cgt gct att ctc gac caa gac tcg gcc cgc gac gcc gtc gtt gtc Glu Arg Ala Ile Leu Asp Gln Asp Ser Ala Arg Asp Ala Val Val Val 2030 2035 2040			6144
atc cgg cac caa gaa ggt gaa gaa ccg gag atg gtt ggt ttc gtc gcg Ile Arg His Gln Glu Gly Glu Glu Pro Glu Met Val Gly Phe Val Ala 2045 2050 2055 2060			6192
acc cac ggc gat cac tct gcc gaa caa gag gaa gca gac gac cag gtt Thr His Gly Asp His Ser Ala Glu Gln Glu Ala Asp Asp Gln Val 2065 2070 2075			6240
gaa ggt tgg aaa gac ttc ttc gag agc aat aca tat gcc gac atg gat Glu Gly Trp Lys Asp Phe Phe Glu Ser Asn Thr Tyr Ala Asp Met Asp 2080 2085 2090			6288
acc atc ggc cag tct gct ata ggc aac gac ttt acg ggc tgg acg tcc Thr Ile Gly Gln Ser Ala Ile Gly Asn Asp Phe Thr Gly Trp Thr Ser 2095 2100 2105			6336

atg tac gac ggg agc gag atc aac aag gcc gag atg cag gag tgg ctc		6384	
Met Tyr Asp Gly Ser Glu Ile Asn Lys Ala Glu Met Gln Glu Trp Leu			
2110	2115	2120	
gac gac acc atg cgc aca ctc ctc gat ggc caa gcg ccg ggt cac gta		6432	
Asp Asp Thr Met Arg Thr Leu Leu Asp Gly Gln Ala Pro Gly His Val			
2125	2130	2135	2140
ctc gaa ata ggc aca ggc agt ggc atg gta ttg ttt aac tta ggg gcc		6480	
Leu Glu Ile Gly Thr Gly Ser Gly Met Val Leu Phe Asn Leu Gly Ala			
2145	2150	2155	
ggg cta caa agc tac gta ggt ctt gaa cca tct aga tct gca gcc acg		6528	
Gly Leu Gln Ser Tyr Val Gly Leu Glu Pro Ser Arg Ser Ala Ala Thr			
2160	2165	2170	
ttt gtt acc aaa gcg atc aat tcc acc cca gct ctt gca gga aag gcc		6576	
Phe Val Thr Lys Ala Ile Asn Ser Thr Pro Ala Leu Ala Gly Lys Ala			
2175	2180	2185	
gaa gtg cac gtc ggc aca gcg aca gac ata aac cga ctt cgt gga ctt		6624	
Glu Val His Val Gly Thr Ala Thr Asp Ile Asn Arg Leu Arg Gly Leu			
2190	2195	2200	
cgt ccc gat cta gtt gtg ctc aac tcg gta gtc cag tat ttc ccc acg		6672	
Arg Pro Asp Leu Val Val Leu Asn Ser Val Val Gln Tyr Phe Pro Thr			
2205	2210	2215	2220
ccc gag tac cta cta gag gtc gtg gag agt ctc gtc cgg att ccg ggc		6720	
Pro Glu Tyr Leu Leu Glu Val Val Glu Ser Leu Val Arg Ile Pro Gly			
2225	2230	2235	
gtc aag cgc gtg gtc ttc ggc gac ata cga tct cac gcc acg aac aga		6768	
Val Lys Arg Val Val Phe Gly Asp Ile Arg Ser His Ala Thr Asn Arg			
2240	2245	2250	
cat ttt ctt gct gcc agg gcg ctg cat tcg ctg ggc tcc aag gcg acc		6816	
His Phe Leu Ala Ala Arg Ala Leu His Ser Leu Gly Ser Lys Ala Thr			
2255	2260	2265	
aaa gat gct ata cgt caa aag atg acg gag atg gaa gag cgc gag gaa		6864	
Lys Asp Ala Ile Arg Gln Lys Met Thr Glu Met Glu Glu Arg Glu Glu			
2270	2275	2280	
gag ctg ctc gtc gac ccg gcc ttc ttc acg gcg ctg ctg cag ggc cag		6912	
Glu Leu Leu Val Asp Pro Ala Phe Phe Thr Ala Leu Leu Gln Gly Gln			
2285	2290	2295	2300
ctt gcc gat cga atc aag cac gtc gag atc ctc ccg aag aac atg cgc		6960	
Leu Ala Asp Arg Ile Lys His Val Glu Ile Leu Pro Lys Asn Met Arg			
2305	2310	2315	
gcc acg aac gag ctg agc gcg tac cgg tat aca gcc gtc att cac gta		7008	
Ala Thr Asn Glu Leu Ser Ala Tyr Arg Tyr Thr Ala Val Ile His Val			
2320	2325	2330	
cgc ggc cca gag gaa cag tcg cgg ccc gtg tat ccg atc caa gtg aac		7056	

Arg	Gly	Pro	Glu	Glu	Gln	Ser	Arg	Pro	Val	Tyr	Pro	Ile	Gln	Val	Asn
2335							2340						2345		
gac tgg atc gac ttt cag gcc tca cgc att gac cgc cgc gcc ctt ctc															7104
Asp	Trp	Ile	Asp	Phe	Gln	Ala	Ser	Arg	Ile	Asp	Arg	Arg	Ala	Leu	Leu
2350							2355						2360		
cga ctc cta cag cgc tcg gca gac gcc gcg acc gtc gcc gtc agc aac															7152
Arg	Leu	Leu	Gln	Arg	Ser	Ala	Asp	Ala	Ala	Thr	Val	Ala	Val	Ser	Asn
2365							2370						2375		
atc ccc tac agc aag acg att gta gaa cgc cat gtc gtc gag tcc ctt															7200
Ile	Pro	Tyr	Ser	Lys	Thr	Ile	Val	Glu	Arg	His	Val	Val	Glu	Ser	Leu
2385							2390						2395		
gac aat aac aac agg gag aat acg cat aga gca cca gac ggc gcg gct															7248
Asp	Asn	Asn	Arg	Glu	Asn	Thr	His	Arg	Ala	Pro	Asp	Gly	Ala	Ala	
2400							2405						2410		
tgg atc tcg gcc gtc cgc tcc aag gcc gag cgc tgc acg tcc ctc tcc															7296
Trp	Ile	Ser	Ala	Val	Arg	Ser	Lys	Ala	Glu	Arg	Cys	Thr	Ser	Leu	Ser
2415							2420						2425		
gtg acc gat ctt gtg cag ctc ggg gaa gaa gcc ggc ttt cgc gta gaa															7344
Val	Thr	Asp	Leu	Val	Gln	Leu	Gly	Glu	Glu	Ala	Gly	Phe	Arg	Val	Glu
2430							2435						2440		
gtc agc gca gcg cgg cag tgg tct caa agc ggc gcg ctc gat gcc gtc															7392
Val	Ser	Ala	Ala	Arg	Gln	Trp	Ser	Gln	Ser	Gly	Ala	Leu	Asp	Ala	Val
2445							2450						2455		
ttt cac cgc tat aat ttg ccc act caa agc aat agt cgc gtt ctg att															7440
Phe	His	Arg	Tyr	Asn	Leu	Pro	Thr	Gln	Ser	Asn	Ser	Arg	Val	Leu	Ile
2465							2470						2475		
cag ttc cct acc gaa gat ggc cag acg cga aga tcc gcc act ctg aca															7488
Gln	Phe	Pro	Thr	Glu	Asp	Gly	Gln	Thr	Arg	Arg	Ser	Ala	Thr	Leu	Thr
2480							2485						2490		
aac cga cca cta cag cgt ctg cag acg cgt cgg ttc gca tca cag atc															7536
Asn	Arg	Pro	Leu	Gln	Arg	Leu	Gln	Ser	Arg	Arg	Phe	Ala	Ser	Gln	Ile
2495							2500						2505		
cgc gaa cag ctg aag gcc gtg ctc ccg tca tac atg atc ccc tcc cgc															7584
Arg	Glu	Gln	Leu	Lys	Ala	Val	Leu	Pro	Ser	Tyr	Met	Ile	Pro	Ser	Arg
2510							2515						2520		
atc gtg gtc ata gac cag atg cct ctc aat gcc aat ggc aag gtc gac															7632
Ile	Val	Val	Ile	Asp	Gln	Met	Pro	Leu	Asn	Ala	Asn	Gly	Lys	Val	Asp
2525							2530						2535		
cgaaaaa ctt acc aga agg gcc caa atc gcg ccg aaa tct cag gcg															7680
Arg	Lys	Glu	Leu	Thr	Arg	Arg	Ala	Gln	Ile	Ala	Pro	Lys	Ser	Gln	Ala
2545							2550						2555		
gct ccc gcc aaa ccc gtc aaa cag gtc gat ccg ttc gtc aac ctg gaa															7728
Ala	Pro	Ala	Lys	Pro	Val	Lys	Gln	Val	Asp	Pro	Phe	Val	Asn	Leu	Glu

2560	2565	2570	
gcc att tta tgt gag gag ttc gcg gag gtg ctg ggc atg gaa gtc ggc Ala Ile Leu Cys Glu Glu Phe Ala Glu Val Leu Gly Met Glu Val Gly	2575	2580	7776
gtg aac gac cac ttc ttc caa cta ggc gga cac tct ctc ttg gcc acg Val Asn Asp His Phe Phe Gln Leu Gly Gly His Ser Leu Leu Ala Thr	2590	2595	7824
aag ctc gtc gcg cgt ctc agt cgt cggt cta aac ggt cgt gtg tct gtg Lys Leu Val Ala Arg Leu Ser Arg Arg Leu Asn Gly Arg Val Ser Val	2605	2610	7872
agg gat gtg ttc gac cag cct gtg att tcc gac ctc gca gtc acc ctc Arg Asp Val Phe Asp Gln Pro Val Ile Ser Asp Leu Ala Val Thr Leu	2625	2630	7920
cgc cag gga ctg acc ttg gaa aac gcc att ccc gca acg ccg gac agc Arg Gln Gly Leu Thr Leu Glu Asn Ala Ile Pro Ala Thr Pro Asp Ser	2640	2645	7968
ggg tat tgg gag cag aca atg tcc gca ccg aca acc ccg agc gac gac Gly Tyr Trp Glu Gln Thr Met Ser Ala Pro Thr Thr Pro Ser Asp Asp	2655	2660	8016
atg gag gcc gtg cta tgc aag gag ttt gcg gat gtg ctt ggc gtc gaa Met Glu Ala Val Leu Cys Lys Glu Phe Ala Asp Val Leu Gly Val Glu	2670	2675	8064
gtc agc gcc acc gac agc ttc ttc gat ctc ggt ggg cat tcc ctc atg Val Ser Ala Thr Asp Ser Phe Phe Asp Leu Gly Gly His Ser Leu Met	2685	2690	8112
gct acg aag ctc gct gcg cgt att agc cgt ccg cta gat gta ccg gtg Ala Thr Lys Leu Ala Ala Arg Ile Ser Arg Arg Leu Asp Val Pro Val	2705	2710	8160
tca atc aaa gac ata ttc gat cac tca gtt cct cta aac ctt gcg agg Ser Ile Lys Asp Ile Phe Asp His Ser Val Pro Leu Asn Leu Ala Arg	2720	2725	8208
aag att cgg ctc act caa gca aaa ggc cac gaa gcg acc aat gga gta Lys Ile Arg Leu Thr Gln Ala Lys Gly His Glu Ala Thr Asn Gly Val	2735	2740	8256
caa atc gcc aac gac gcc cca ttc caa ctc att tcc gta gaa gat cca Gln Ile Ala Asn Asp Ala Pro Phe Gln Leu Ile Ser Val Glu Asp Pro	2750	2755	8304
gag ata ttc gtc caa cgt gaa atc gcc cct caa cta caa tgc tca ccc Glu Ile Phe Val Gln Arg Glu Ile Ala Pro Gln Leu Gln Cys Ser Pro	2765	2770	8352
gag aca atc cta gac gtc tac ccc gcc acg caa atg caa agg gtc ttc Glu Thr Ile Leu Asp Val Tyr Pro Ala Thr Gln Met Gln Arg Val Phe	2785	2790	8400
		2795	

ctc ctc aac cca gta aca gga aag ccg cgc tca cca acg cca ttt cac Leu Leu Asn Pro Val Thr Gly Lys Pro Arg Ser Pro Thr Pro Phe His 2800 2805 2810	8448
ata gac ttc ccg ccg gac gca gac tgc gcc agc ctg atg cggtt gca tgt Ile Asp Phe Pro Pro Asp Ala Asp Cys Ala Ser Leu Met Arg Ala Cys 2815 2820 2825	8496
gca tct cta gcg aag cat ttc gat atc ttc agg acg gtg ttc ctc gaa Ala Ser Leu Ala Lys His Phe Asp Ile Phe Arg Thr Val Phe Leu Glu 2830 2835 2840	8544
gcc aga ggc gaa ctc tac caa gta gtt cta aaa cac gtc gac gtg ccc Ala Arg Gly Glu Leu Tyr Gln Val Val Leu Lys His Val Asp Val Pro 2845 2850 2855 2860	8592
atc gag atg ctc cag acc gaa aac atc aac acg gcg acc cgg tcg Ile Glu Met Leu Gln Thr Glu Glu Asn Ile Asn Ser Ala Thr Arg Ser 2865 2870 2875	8640
ttc ctg gac gta gac gca gaa aaa ccc atc cgg cta ggc cag cca ctg Phe Leu Asp Val Asp Ala Glu Lys Pro Ile Arg Leu Gly Gln Pro Leu 2880 2885 2890	8688
atc cgc atc gcg ata cta gag aag ccc ggg tcc acg ctg cgc gtc atc Ile Arg Ile Ala Ile Leu Glu Lys Pro Gly Ser Thr Leu Arg Val Ile 2895 2900 2905	8736
cta cga tta tcc cac gcc tta tac gac ggc ctg acg cta gag cac atc Leu Arg Leu Ser His Ala Leu Tyr Asp Gly Leu Ser Leu Glu His Ile 2910 2915 2920	8784
ctg cac tct ctg cac atc ctc ttt ttc ggc ggc agt ctt ccc ccg ccg Leu His Ser Leu His Ile Leu Phe Phe Gly Gly Ser Leu Pro Pro Pro 2925 2930 2935 2940	8832
ccc aag ttc gcc ggg tac atg caa cac gtc gcg acg agt cgc aga gaa Pro Lys Phe Ala Gly Tyr Met Gln His Val Ala Ser Ser Arg Arg Glu 2945 2950 2955	8880
ggc tac gat ttc tgg cgt tcc gtt ctc cga gat tcg tct atg aca gtc Gly Tyr Asp Phe Trp Arg Ser Val Leu Arg Asp Ser Ser Met Thr Val 2960 2965 2970	8928
atc aaa ggc aac aat aat aca act cca cca cct cct cct cta caa caa caa Ile Lys Gly Asn Asn Asn Thr Thr Pro Pro Pro Pro Gln Gln Gln 2975 2980 2985	8976
tcc acc ccc tcc gga gcc cac cac gcc tcc aaa gta gtc act atc cca Ser Thr Pro Ser Gly Ala His His Ala Ser Lys Val Val Thr Ile Pro 2990 2995 3000	9024
acc caa gcc aac aca gac agc cgg atc acg cgc gcc acg atc ttc act Thr Gln Ala Asn Thr Asp Ser Arg Ile Thr Arg Ala Thr Ile Phe Thr 3005 3010 3015 3020	9072
acc gct tgc gca cta atg ctc gcg aaa gaa gac aac tcc acg gac gtc	9120

Thr Ala Cys Ala Leu Met Leu Ala Lys Glu Asp Asn Ser Ser Asp Val			
3025	3030	3035	
gtc ttc ggg cgt acg gta tcg ggg cgt caa ggc ctg ccc cta gcc cac			9168
Val Phe Gly Arg Thr Val Ser Gly Arg Gln Gly Leu Pro Leu Ala His			
3040	3045	3050	
caa aac gtg atc gga cca tgt ctc aac caa gtg ccc gtg cgc gcg cgc			9216
Gln Asn Val Ile Gly Pro Cys Leu Asn Gln Val Pro Val Arg Ala Arg			
3055	3060	3065	
ggt tta aac cga gga acc act cac cac cga gaa ctt ctc cgc gag atg			9264
Gly Leu Asn Arg Gly Thr Thr His His Arg Glu Leu Leu Arg Glu Met			
3070	3075	3080	
caa gag caa tat ctc aac agt ctc gct ttc gaa act ctc ggg tac gac			9312
Gln Glu Gln Tyr Leu Asn Ser Leu Ala Phe Glu Thr Leu Gly Tyr Asp			
3085	3090	3095	3100
gag atc aag gcg cac tgc aca gac tgg ccg gac gtg cca gcg acc gcg			9360
Glu Ile Lys Ala His Cys Thr Asp Trp Pro Asp Val Pro Ala Thr Ala			
3105	3110	3115	
agc ttc ggg tgc tgc atc gtg tac cag aac ttc gat tcg cac ccg gac			9408
Ser Phe Gly Cys Cys Ile Val Tyr Gln Asn Phe Asp Ser His Pro Asp			
3120	3125	3130	
agc cga gtc gaa gag cag ccg ctg cag atc ggg gtc ttg tcg ccg aac			9456
Ser Arg Val Glu Glu Gln Arg Leu Gln Ile Gly Val Leu Ser Arg Asn			
3135	3140	3145	
tac gag gct att aat gag ggg ctc gtg cat gat ctt gtt att gct ggg			9504
Tyr Glu Ala Ile Asn Glu Gly Leu Val His Asp Leu Val Ile Ala Gly			
3150	3155	3160	
gag tcg gag cct gat ggg gat gat ttg agg gtt act gtt gtg gcg aat			9552
Glu Ser Glu Pro Asp Gly Asp Asp Leu Arg Val Thr Val Val Ala Asn			
3165	3170	3175	3180
cgg agg ttg tgc gat gag gaa agg ttg aag agg atg ctg gag gag ctg			9600
Arg Arg Leu Cys Asp Glu Glu Arg Leu Lys Arg Met Leu Glu Glu Leu			
3185	3190	3195	
tgt ggg aat att cgg gct ttg gcg ttg gtt tag			9633
Cys Gly Asn Ile Arg Ala Leu Ala Leu Val			
3200	3205		
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<213> Mycelia sterilia			
<400> 2			
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Leu Ser Leu Ser Cys Pro Leu Leu Pro His Asp Asp Glu Lys His Ser
 20 25 30

Asp Asn Leu Tyr Glu Gln Ala Thr Arg His Phe Gly Leu Ser Arg Asp
 35 40 45

Lys Ile Glu Asn Val Leu Pro Cys Thr Ser Phe Gln Cys Asp Val Ile
 50 55 60

Asp Cys Ala Val Asp Asp Arg Arg His Ala Ile Gly His Val Val Tyr
 65 70 75 80

Asp Ile Pro Asn Thr Val Asp Ile Gln Arg Leu Ala Ala Ala Trp Lys
 85 90 95

Glu Val Val Arg Gln Thr Pro Ile Leu Arg Thr Gly Ile Phe Thr Ser
 100 105 110

Glu Thr Gly Asp Ser Phe Gln Ile Val Leu Lys Glu Gly Cys Leu Pro
 115 120 125

Trp Met Tyr Ala Thr Cys Leu Gly Met Lys Gly Ala Val Ile Gln Asp
 130 135 140

Glu Ala Val Ala Ala Met Thr Gly Pro Arg Cys Asn Arg Tyr Val Val
 145 150 155 160

Leu Glu Asp Pro Ser Thr Lys Gln Arg Leu Leu Ile Trp Thr Phe Ser
 165 170 175

His Ala Leu Val Asp Tyr Thr Val Gln Glu Arg Ile Leu Gln Arg Val
 180 185 190

Leu Thr Val Tyr Asp Gly Arg Asp Val Glu Cys Pro Arg Ile Lys Asp
 195 200 205

Thr Glu His Val Ser Arg Phe Trp Gln Gln His Phe Glu Gly Leu Asp
 210 215 220

Ala Ser Val Phe Pro Leu Leu Pro Ser His Leu Thr Val Cys Asn Pro
 225 230 235 240

Asn Ala Arg Ala Glu His His Ile Ser Tyr Thr Gly Pro Val Gln Arg
 245 250 255

Lys Trp Ser His Thr Ser Ile Cys Arg Ala Ala Leu Ala Val Leu Leu
 260 265 270

Ser Arg Phe Thr His Ser Ser Glu Ala Leu Phe Gly Val Val Thr Glu
 275 280 285

Gln Ser His Asn Ser Glu Asp Gln Arg Arg Ser Ile Asp Gly Pro Ala
 290 295 300

Arg Thr Val Val Pro Ile Arg Val Leu Cys Ala Pro Asp Gln Tyr Val
 305 310 315 320

Ser Asp Val Ile Gly Ala Ile Thr Ala His Glu His Ala Met Arg Gly
 325 330 335
 Phe Glu His Ala Gly Leu Arg Asn Ile Arg Arg Thr Gly Asp Asp Gly
 340 345 350
 Ser Ala Ala Cys Gly Phe Gln Thr Val Leu Leu Val Thr Asp Gly Asp
 355 360 365
 Ala Pro Lys Thr Pro Gly Ser Val Leu His Arg Ser Val Glu Glu Ser
 370 375 380
 Asp Arg Phe Met Pro Cys Ala Asn Arg Ala Leu Leu Leu Asp Cys Gln
 385 390 395 400
 Met Ala Gly Asn Ser Ala Ser Leu Val Ala Arg Tyr Asp His Asn Val
 405 410 415
 Ile Asp Pro Arg Gln Met Ser Arg Phe Leu Arg Gln Leu Gly Tyr Leu
 420 425 430
 Ile Gln Gln Phe His His His Val Asp Leu Pro Leu Val Lys Glu Leu
 435 440 445
 Asp Val Val Thr Ala Glu Asp Cys Ala Glu Ile Glu Lys Trp Asn Ser
 450 455 460
 Glu Arg Leu Thr Met Gln Asp Ala Leu Ile His Asp Thr Ile Ser Lys
 465 470 475 480
 Trp Ala Ala Gly Asp Pro Asn Lys Ala Ala Val Phe Ala Trp Asp Gly
 485 490 495
 Glu Trp Thr Tyr Ala Glu Leu Asp Asn Ile Ser Ser Arg Leu Ala Val
 500 505 510
 Tyr Ile Gln Ser Leu Asp Leu Arg Pro Gly Gln Ala Ile Leu Pro Leu
 515 520 525
 Cys Phe Glu Lys Ser Lys Trp Val Val Ala Thr Ile Leu Ala Val Leu
 530 535 540
 Lys Val Gly Arg Ala Phe Thr Leu Ile Asp Pro Cys Asp Pro Ser Ala
 545 550 555 560
 Arg Met Ala Gln Val Cys Gln Gln Thr Ser Ala Thr Val Ala Leu Thr
 565 570 575
 Ser Lys Leu His Asn Thr Thr Leu Arg Ser Val Val Ser Arg Cys Ile
 580 585 590
 Val Val Asp Asp Asp Leu Leu Arg Ser Leu Pro His Ala Asp Gly Arg
 595 600 605
 Leu Lys Ala Thr Val Lys Pro Gln Asp Leu Ala Tyr Val Ile Phe Thr
 610 615 620

Ser Gly Ser Thr Gly Glu Pro Lys Gly Ile Met Ile Glu His Arg Gly
 625 630 635 640
 Phe Val Ser Cys Ala Met Lys Phe Gly Pro Ala Leu Gly Met Asp Glu
 645 650 655
 His Thr Arg Ala Leu Gln Phe Ala Ser Tyr Ala Phe Gly Ala Cys Leu
 660 665 670
 Val Glu Val Val Thr Ala Leu Met His Gly Gly Cys Val Cys Ile Pro
 675 680 685
 Ser Asp Asp Asp Arg Leu Asn Asn Val Pro Glu Phe Ile Lys Arg Ala
 690 695 700
 Gln Val Asn Trp Val Ile Leu Thr Pro Ser Tyr Ile Gly Thr Phe Gln
 705 710 715 720
 Pro Glu Asp Val Pro Gly Leu Gln Thr Leu Val Leu Val Gly Glu Pro
 725 730 735
 Ile Ser Ala Ser Ile Arg Asp Thr Trp Ala Ser Gln Val Arg Leu Leu
 740 745 750
 Asn Ala Tyr Gly Gln Ser Glu Ser Ser Thr Met Cys Ser Val Thr Glu
 755 760 765
 Val Ser Pro Leu Ser Leu Glu Pro Asn Asn Ile Gly Arg Ala Val Gly
 770 775 780
 Ala Arg Ser Trp Ile Ile Asp Pro Asp Glu Pro Asp Arg Leu Ala Pro
 785 790 795 800
 Ile Gly Cys Ile Gly Glu Leu Val Ile Glu Ser Pro Gly Ile Ala Arg
 805 810 815
 Asp Tyr Ile Ile Ala Pro Pro Asp Lys Ser Pro Phe Leu Leu Ala
 820 825 830
 Pro Pro Ala Trp Tyr Pro Ala Gly Lys Leu Ser Asn Ala Phe Lys Phe
 835 840 845
 Tyr Lys Thr Gly Asp Leu Val Arg Tyr Gly Pro Asp Gly Thr Ile Val
 850 855 860
 Cys Leu Gly Arg Lys Asp Ser Gln Val Lys Ile Arg Gly Gln Arg Val
 865 870 875 880
 Glu Ile Ser Ala Val Glu Ala Ser Leu Arg Arg Gln Leu Pro Ser Asp
 885 890 895
 Ile Met Pro Val Ala Glu Ala Ile Lys Arg Ser Asp Ser Ser Gly Ser
 900 905 910
 Thr Val Leu Thr Ala Phe Leu Ile Gly Ser Ser Lys Ser Gly Asp Gly
 915 920 925

Asn Gly His Ala Leu Ser Ala Ala Asp Ala Val Ile Leu Asp His Gly
930 935 940

Ala Thr Asn Glu Ile Asn Ala Lys Leu Gln Gln Ile Leu Pro Gln His
945 950 955 960

Ser Val Pro Ser Tyr Tyr Ile His Met Glu Asn Leu Pro Arg Thr Ala
965 970 975

Thr Gly Lys Ala Asp Arg Lys Met Leu Arg Ser Ile Ala Ser Lys Leu
980 985 990

Leu Gly Glu Leu Ser Gln Asn Val Thr Ser Gln Pro Ile Glu Lys His
995 1000 1005

Asp Ala Pro Ala Thr Gly Ile Glu Val Lys Leu Lys Glu Leu Trp Phe
1010 1015 1020

Leu Ser Leu Asn Leu Asn Pro Asn Ser Gln Asp Val Gly Ala Ser Phe
1025 1030 1035 1040

Phe Asp Leu Gly Gly Asn Ser Ile Ile Ala Ile Lys Met Val Asn Met
1045 1050 1055

Ala Arg Ser Ala Gly Ile Ala Leu Lys Val Ser Asp Ile Phe Gln Asn
1060 1065 1070

Pro Thr Leu Ala Gly Leu Val Asp Val Ile Gly Arg Asp Pro Ala Pro
1075 1080 1085

Tyr Asn Leu Ile Pro Thr Thr Ala Tyr Ser Gly Pro Val Glu Gln Ser
1090 1095 1100

Phe Ala Gln Gly Arg Leu Trp Phe Leu Asp Gln Ile Glu Leu Asp Ala
1105 1110 1115 1120

Leu Trp Tyr Leu Leu Pro Tyr Ala Val Arg Met Arg Gly Pro Leu His
1125 1130 1135

Ile Asp Ala Leu Thr Ile Ala Leu Leu Ala Ile Gln Gln Arg His Glu
1140 1145 1150

Thr Leu Arg Thr Thr Phe Glu Glu Gln Asp Gly Val Gly Val Gln Val
1155 1160 1165

Val His Ala Ser Pro Ile Ser Asp Leu Arg Ile Ile Asp Val Ser Gly
1170 1175 1180

Asp Arg Asn Ser Asp Tyr Leu Gln Leu Leu His Gln Glu Gln Thr Thr
1185 1190 1195 1200

Pro Phe Ile Leu Ala Cys Gln Ala Gly Trp Arg Val Ser Leu Ile Arg
1205 1210 1215

Leu Gly Glu Asp Asp His Ile Leu Ser Ile Val Met His His Ile Ile
1220 1225 1230

Ser Asp Gly Trp Ser Ile Asp Ile Leu Arg Arg Glu Leu Ser Asn Phe
 1235 1240 1245
 Tyr Ser Ala Ala Leu Arg Gly Ser Asp Pro Leu Ser Val Val Ser Pro
 1250 1255 1260
 Leu Pro Leu His Tyr Arg Asp Phe Ser Val Trp Gln Lys Gln Val Glu
 1265 1270 1275 1280
 Gln Glu Thr Glu His Glu Arg Gln Leu Glu Tyr Trp Val Lys Gln Leu
 1285 1290 1295
 Ala Asp Ser Ser Ala Ala Glu Phe Leu Thr Asp Phe Pro Arg Pro Asn
 1300 1305 1310
 Ile Leu Ser Gly Glu Ala Gly Ser Val Pro Val Thr Ile Glu Gly Glu
 1315 1320 1325
 Leu Tyr Glu Arg Leu Gln Glu Phe Cys Lys Val Glu Gln Met Thr Pro
 1330 1335 1340
 Phe Ala Val Leu Leu Gly Ala Phe Arg Ala Thr His Tyr Arg Leu Thr
 1345 1350 1355 1360
 Gly Ala Glu Asp Ser Ile Ile Gly Thr Pro Ile Ala Asn Arg Asn Arg
 1365 1370 1375
 Gln Glu Leu Glu Asn Met Ile Gly Phe Phe Val Asn Thr Gln Cys Met
 1380 1385 1390
 Arg Ile Thr Val Asp Gly Asp Asp Thr Phe Glu Ser Leu Val Arg Gln
 1395 1400 1405
 Val Arg Thr Thr Ala Thr Ala Ala Phe Glu His Gln Asp Val Pro Phe
 1410 1415 1420
 Glu Arg Val Val Thr Ala Leu Leu Pro Arg Ser Arg Asp Leu Ser Arg
 1425 1430 1435 1440
 Asn Pro Leu Ala Gln Leu Thr Phe Ala Leu His Ser Gln Gln Asp Leu
 1445 1450 1455
 Gly Lys Phe Glu Leu Glu Gly Leu Val Ala Glu Pro Val Ser Asn Lys
 1460 1465 1470
 Val Tyr Thr Arg Phe Asp Val Glu Phe His Leu Phe Gln Glu Ala Gly
 1475 1480 1485
 Arg Leu Ser Gly Asn Val Ala Phe Ala Ala Asp Leu Phe Lys Pro Glu
 1490 1495 1500
 Thr Ile Ser Asn Val Val Ala Ile Phe Phe Gln Ile Leu Arg Gln Gly
 1505 1510 1515 1520
 Ile Arg Gln Pro Arg Thr Pro Ile Ala Val Leu Pro Leu Thr Asp Gly
 1525 1530 1535

Leu Ala Asp Leu Arg Ala Met Gly Leu Leu Glu Ile Glu Lys Ala Glu
 1540 1545 1550
 Tyr Pro Arg Glu Ser Ser Val Val Asp Val Phe Arg Lys Gln Val Ala
 1555 1560 1565
 Ala His Pro His Ala Phe Ala Val Val Asp Ser Ala Ser Arg Leu Thr
 1570 1575 1580
 Tyr Ala Asp Leu Asp Arg Gln Ser Asp Gln Leu Ala Thr Trp Leu Gly
 1585 1590 1595 1600
 Arg Arg Asn Met Thr Ala Glu Thr Leu Val Gly Val Leu Ala Pro Arg
 1605 1610 1615
 Ser Cys Gln Thr Val Val Ala Ile Leu Gly Ile Leu Lys Ala Asn Leu
 1620 1625 1630
 Ala Tyr Leu Pro Leu Asp Val Asn Cys Pro Thr Ala Arg Leu Gln Thr
 1635 1640 1645
 Ile Leu Ser Thr Leu Asn Arg His Lys Leu Val Leu Leu Gly Ser Asn
 1650 1655 1660
 Ala Thr Thr Pro Asp Val Gln Ile Pro Asp Val Glu Leu Val Arg Ile
 1665 1670 1675 1680
 Ser Asp Ile Leu Asp Arg Pro Ile Asn Gly Gln Ala Lys Leu Asn Gly
 1685 1690 1695
 His Thr Lys Ser Asn Gly Tyr Ser Lys Pro Asn Gly Tyr Thr His Leu
 1700 1705 1710
 Lys Gly Tyr Ser Asn Leu Asn Gly Tyr Ser Lys Gln Asn Gly Tyr Ala
 1715 1720 1725
 Gln Leu Asn Gly His Arg Glu Arg Asn Asn Tyr Leu Asp Leu Asn Gly
 1730 1735 1740
 His Ser Leu Leu Asn Gly Asn Ser Asp Ile Thr Thr Ser Gly Pro Ser
 1745 1750 1755 1760
 Ala Thr Ser Leu Ala Tyr Val Ile Phe Thr Ser Gly Ser Thr Gly Lys
 1765 1770 1775
 Pro Lys Gly Val Met Val Glu His Arg Ser Ile Ile Arg Leu Ala Lys
 1780 1785 1790
 Lys Asn Arg Ile Ile Ser Arg Phe Pro Ser Val Ala Lys Val Ala His
 1795 1800 1805
 Leu Ser Asn Ile Ala Phe Asp Ala Ala Thr Trp Glu Met Phe Ala Ala
 1810 1815 1820
 Leu Leu Asn Gly Gly Thr Leu Val Cys Ile Asp Tyr Met Thr Thr Leu
 1825 1830 1835 1840

Asp Ser Lys Thr Leu Glu Ala Ala Phe Ala Arg Glu Gln Ile Asn Ala
1845 1850 1855

Ala Leu Leu Thr Pro Ala Leu Leu Lys Gln Cys Leu Ala Asn Ile Pro
1860 1865 1870

Thr Thr Leu Gly Arg Leu Ser Ala Leu Val Ile Gly Gly Asp Arg Leu
1875 1880 1885

Asp Gly Gln Asp Ala Ile Ala Ala His Ala Leu Val Gly Ala Gly Val
1890 1895 1900

Tyr Asn Ala Tyr Gly Pro Thr Glu Asn Gly Val Ile Ser Thr Ile Tyr
1905 1910 1915 1920

Asn Ile Thr Lys Asn Asp Ser Phe Ile Asn Gly Val Pro Ile Gly Cys
1925 1930 1935

Ala Ile Ser Asn Ser Gly Ala Tyr Ile Thr Asp Pro Asp Gln Gln Leu
1940 1945 1950

Val Pro Pro Gly Val Met Gly Glu Leu Val Val Thr Gly Asp Gly Leu
1955 1960 1965

Ala Arg Gly Tyr Thr Asp Pro Ala Leu Asp Ala Gly Arg Phe Val Gln
1970 1975 1980

Ile Met Ile Asn Asp Lys Ala Val Arg Ala Tyr Arg Thr Gly Asp Arg
1985 1990 1995 2000

Ala Arg Tyr Arg Val Gly Asp Gly Gln Ile Glu Phe Phe Gly Arg Met
2005 2010 2015

Asp Gln Gln Val Lys Ile Arg Gly His Arg Ile Glu Pro Ala Glu Val
2020 2025 2030

Glu Arg Ala Ile Leu Asp Gln Asp Ser Ala Arg Asp Ala Val Val Val
2035 2040 2045

Ile Arg His Gln Glu Gly Glu Glu Pro Glu Met Val Gly Phe Val Ala
2050 2055 2060

Thr His Gly Asp His Ser Ala Glu Gln Glu Ala Asp Asp Gln Val
2065 2070 2075 2080

Glu Gly Trp Lys Asp Phe Phe Glu Ser Asn Thr Tyr Ala Asp Met Asp
2085 2090 2095

Thr Ile Gly Gln Ser Ala Ile Gly Asn Asp Phe Thr Gly Trp Thr Ser
2100 2105 2110

Met Tyr Asp Gly Ser Glu Ile Asn Lys Ala Glu Met Gln Glu Trp Leu
2115 2120 2125

Asp Asp Thr Met Arg Thr Leu Leu Asp Gly Gln Ala Pro Gly His Val
2130 2135 2140

Leu Glu Ile Gly Thr Gly Ser Gly Met Val Leu Phe Asn Leu Gly Ala
 2145 2150 2155 2160
 Gly Leu Gln Ser Tyr Val Gly Leu Glu Pro Ser Arg Ser Ala Ala Thr
 2165 2170 2175
 Phe Val Thr Lys Ala Ile Asn Ser Thr Pro Ala Leu Ala Gly Lys Ala
 2180 2185 2190
 Glu Val His Val Gly Thr Ala Thr Asp Ile Asn Arg Leu Arg Gly Leu
 2195 2200 2205
 Arg Pro Asp Leu Val Val Leu Asn Ser Val Val Gln Tyr Phe Pro Thr
 2210 2215 2220
 Pro Glu Tyr Leu Leu Glu Val Val Glu Ser Leu Val Arg Ile Pro Gly
 2225 2230 2235 2240
 Val Lys Arg Val Val Phe Gly Asp Ile Arg Ser His Ala Thr Asn Arg
 2245 2250 2255
 His Phe Leu Ala Ala Arg Ala Leu His Ser Leu Gly Ser Lys Ala Thr
 2260 2265 2270
 Lys Asp Ala Ile Arg Gln Lys Met Thr Glu Met Glu Glu Arg Glu Glu
 2275 2280 2285
 Glu Leu Leu Val Asp Pro Ala Phe Phe Thr Ala Leu Leu Gln Gly Gln
 2290 2295 2300
 Leu Ala Asp Arg Ile Lys His Val Glu Ile Leu Pro Lys Asn Met Arg
 2305 2310 2315 2320
 Ala Thr Asn Glu Leu Ser Ala Tyr Arg Tyr Thr Ala Val Ile His Val
 2325 2330 2335
 Arg Gly Pro Glu Glu Gln Ser Arg Pro Val Tyr Pro Ile Gln Val Asn
 2340 2345 2350
 Asp Trp Ile Asp Phe Gln Ala Ser Arg Ile Asp Arg Arg Ala Leu Leu
 2355 2360 2365
 Arg Leu Leu Gln Arg Ser Ala Asp Ala Ala Thr Val Ala Val Ser Asn
 2370 2375 2380
 Ile Pro Tyr Ser Lys Thr Ile Val Glu Arg His Val Val Glu Ser Leu
 2385 2390 2395 2400
 Asp Asn Asn Asn Arg Glu Asn Thr His Arg Ala Pro Asp Gly Ala Ala
 2405 2410 2415
 Trp Ile Ser Ala Val Arg Ser Lys Ala Glu Arg Cys Thr Ser Leu Ser
 2420 2425 2430
 Val Thr Asp Leu Val Gln Leu Gly Glu Glu Ala Gly Phe Arg Val Glu
 2435 2440 2445

Val Ser Ala Ala Arg Gln Trp Ser Gln Ser Gly Ala Leu Asp Ala Val
2450 2455 2460

Phe His Arg Tyr Asn Leu Pro Thr Gln Ser Asn Ser Arg Val Leu Ile
2465 2470 2475 2480

Gln Phe Pro Thr Glu Asp Gly Gln Thr Arg Arg Ser Ala Thr Leu Thr
2485 2490 2495

Asn Arg Pro Leu Gln Arg Leu Gln Ser Arg Arg Phe Ala Ser Gln Ile
2500 2505 2510

Arg Glu Gln Leu Lys Ala Val Leu Pro Ser Tyr Met Ile Pro Ser Arg
2515 2520 2525

Ile Val Val Ile Asp Gln Met Pro Leu Asn Ala Asn Gly Lys Val Asp
2530 2535 2540

Arg Lys Glu Leu Thr Arg Arg Ala Gln Ile Ala Pro Lys Ser Gln Ala
2545 2550 2555 2560

Ala Pro Ala Lys Pro Val Lys Gln Val Asp Pro Phe Val Asn Leu Glu
2565 2570 2575

Ala Ile Leu Cys Glu Glu Phe Ala Glu Val Leu Gly Met Glu Val Gly
2580 2585 2590

Val Asn Asp His Phe Phe Gln Leu Gly Gly His Ser Leu Leu Ala Thr
2595 2600 2605

Lys Leu Val Ala Arg Leu Ser Arg Arg Leu Asn Gly Arg Val Ser Val
2610 2615 2620

Arg Asp Val Phe Asp Gln Pro Val Ile Ser Asp Leu Ala Val Thr Leu
2625 2630 2635 2640

Arg Gln Gly Leu Thr Leu Glu Asn Ala Ile Pro Ala Thr Pro Asp Ser
2645 2650 2655

Gly Tyr Trp Glu Gln Thr Met Ser Ala Pro Thr Thr Pro Ser Asp Asp
2660 2665 2670

Met Glu Ala Val Leu Cys Lys Glu Phe Ala Asp Val Leu Gly Val Glu
2675 2680 2685

Val Ser Ala Thr Asp Ser Phe Phe Asp Leu Gly Gly His Ser Leu Met
2690 2695 2700

Ala Thr Lys Leu Ala Ala Arg Ile Ser Arg Arg Leu Asp Val Pro Val
2705 2710 2715 2720

Ser Ile Lys Asp Ile Phe Asp His Ser Val Pro Leu Asn Leu Ala Arg
2725 2730 2735

Lys Ile Arg Leu Thr Gln Ala Lys Gly His Glu Ala Thr Asn Gly Val
2740 2745 2750

Gln Ile Ala Asn Asp Ala Pro Phe Gln Leu Ile Ser Val Glu Asp Pro
2755 2760 2765

Glu Ile Phe Val Gln Arg Glu Ile Ala Pro Gln Leu Gln Cys Ser Pro
2770 2775 2780

Glu Thr Ile Leu Asp Val Tyr Pro Ala Thr Gln Met Gln Arg Val Phe
2785 2790 2795 2800

Leu Leu Asn Pro Val Thr Gly Lys Pro Arg Ser Pro Thr Pro Phe His
2805 2810 2815

Ile Asp Phe Pro Pro Asp Ala Asp Cys Ala Ser Leu Met Arg Ala Cys
2820 2825 2830

Ala Ser Leu Ala Lys His Phe Asp Ile Phe Arg Thr Val Phe Leu Glu
2835 2840 2845

Ala Arg Gly Glu Leu Tyr Gln Val Val Leu Lys His Val Asp Val Pro
2850 2855 2860

Ile Glu Met Leu Gln Thr Glu Glu Asn Ile Asn Ser Ala Thr Arg Ser
2865 2870 2875 2880

Phe Leu Asp Val Asp Ala Glu Lys Pro Ile Arg Leu Gly Gln Pro Leu
2885 2890 2895

Ile Arg Ile Ala Ile Leu Glu Lys Pro Gly Ser Thr Leu Arg Val Ile
2900 2905 2910

Leu Arg Leu Ser His Ala Leu Tyr Asp Gly Leu Ser Leu Glu His Ile
2915 2920 2925

Leu His Ser Leu His Ile Leu Phe Phe Gly Gly Ser Leu Pro Pro Pro
2930 2935 2940

Pro Lys Phe Ala Gly Tyr Met Gln His Val Ala Ser Ser Arg Arg Glu
2945 2950 2955 2960

Gly Tyr Asp Phe Trp Arg Ser Val Leu Arg Asp Ser Ser Met Thr Val
2965 2970 2975

Ile Lys Gly Asn Asn Asn Thr Thr Pro Pro Pro Pro Gln Gln Gln
2980 2985 2990

Ser Thr Pro Ser Gly Ala His His Ala Ser Lys Val Val Thr Ile Pro
2995 3000 3005

Thr Gln Ala Asn Thr Asp Ser Arg Ile Thr Arg Ala Thr Ile Phe Thr
3010 3015 3020

Thr Ala Cys Ala Leu Met Leu Ala Lys Glu Asp Asn Ser Ser Asp Val
3025 3030 3035 3040

Val Phe Gly Arg Thr Val Ser Gly Arg Gln Gly Leu Pro Leu Ala His
3045 3050 3055

Gln Asn Val Ile Gly Pro Cys Leu Asn Gln Val Pro Val Arg Ala Arg
3060 3065 3070

Gly Leu Asn Arg Gly Thr Thr His His Arg Glu Leu Leu Arg Glu Met
3075 3080 3085

Gln Glu Gln Tyr Leu Asn Ser Leu Ala Phe Glu Thr Leu Gly Tyr Asp
3090 3095 3100

Glu Ile Lys Ala His Cys Thr Asp Trp Pro Asp Val Pro Ala Thr Ala
3105 3110 3115 3120

Ser Phe Gly Cys Cys Ile Val Tyr Gln Asn Phe Asp Ser His Pro Asp
3125 3130 3135

Ser Arg Val Glu Glu Gln Arg Leu Gln Ile Gly Val Leu Ser Arg Asn
3140 3145 3150

Tyr Glu Ala Ile Asn Glu Gly Leu Val His Asp Leu Val Ile Ala Gly
3155 3160 3165

Glu Ser Glu Pro Asp Gly Asp Asp Leu Arg Val Thr Val Val Ala Asn
3170 3175 3180

Arg Arg Leu Cys Asp Glu Glu Arg Leu Lys Arg Met Leu Glu Glu Leu
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Cys Gly Asn Ile Arg Ala Leu Ala Leu Val
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<210> 3

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<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Concensus Sequence

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Trp Thr Ser Met Tyr Asp Gly
1 5

<210> 4

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Concensus Sequence

<400> 4

Val Val Gln Tyr Phe Pro Thr
1 5

<210> 5
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer for Cyclic Depsipeptide Synthetase Gene

<220>
<221> base
<222> (6)
<223> n = a, g, c or t

<220>
<221> base
<222> (7)
<223> w = a or t

<220>
<221> base
<222> (8)
<223> s = g or c

<220>
<221> base
<222> (9)
<223> n = a, g, c or t

<220>
<221> base
<222> (15)
<223> y = t or c

<220>
<221> base
<222> (18)
<223> y = t or c

<400> 5
tggacnwsna tgtaygaygg

20

<210> 6
<211> 20
<212> DNA
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<220>
<223> Description of Artificial Sequence: Primer for Cyclic Depsipeptide Synthetase Gene

<220>
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<223> n = a, g, c or t

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<220>
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<222> (6)
<223> r = g or a

<220>
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<222> (9)
<223> r = g or a

<220>
<221> base
<222> (12)
<223> y = t or c

<220>
<221> base
<222> (15)
<223> n = a, g, c or t

<220>
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<223> n = a, g, c or t

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gtnggraart aytgnacnac                                20

<210> 7
<211> 30
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<220>
<223> Description of Artificial Sequence: Primer for Cyclic Depsipeptide
      Synthetase Gene

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gcggaattaa ccctcactaa agggAACGAA                                30

<210> 8
<211> 30
<212> DNA
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<212> DNA
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<210> 12
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<212> DNA
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<210> 13
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<212> DNA
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<223> Description of Artificial Sequence: Primer for Cyclic Depsipeptide

Synthetase Gene

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<210> 15
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<210> 16
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27

<210> 19

<211> 29

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer for Abp1 Gene

<400> 19

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29

<210> 20

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer for Abp 1 Gene Promoter

<400> 20

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20

<210> 21

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer for Cyclic Depsipeptide Synthetase Gene

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20